A New Management Model for Government: Integrating Activity Based Costing, the Balanced Scorecard and Total Quality Management with the Planning, Programming and Budgeting System

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ABSTRACT

Modern governments throughout the world face the same basic set of management challenges: a) to improve effectiveness—emphasizing outputs over inputs; b) to improve efficiency—managing costs; and c) to improve accountability—tying budgets to performance. This paper builds a new management model for government that addresses these challenges. Combining key principles of Activity Based Costing (ABC), the Balanced Scorecard (BSC), and Total Quality Management (TQM) with the spirit of the Planning, Programming and Budgeting System (PPBS) a new model emerges that bridges the gap between business and government. This integrated public management model is applied to generate fresh insights into two ongoing U.S. federal management initiatives: i) the Congressionally-mandated "Government Performance and Results Act" (GPRA), and ii) the President's "Management Agenda."

INTRODUCTION

Modern governments throughout the world face the same basic set of management challenges: a) to improve effectiveness—emphasizing outputs over inputs; b) to improve efficiency—managing costs; and c) to improve accountability—tying budgets to performance. To assist public officials to address these challenges, this paper offers a new integrated public management model called the "**S**uper-**U**nified **C**ustomer and **C**ost **E**valuation **S**trategic **S**ystem" (or SUCCESS).[1]

Resting on fundamental economic and accounting principles, SUCCESS integrates three key business management frameworks that underpin many commercial Enterprise Resource Planning[2] (ERP) applications: Activity-Based Costing [ABC: Johnson & Kaplan 1987, Brimson & Berliner 1988; Player & Cobble 1999]; the Balanced Scorecard [BSC: Kaplan & Norton, 1992; 1996a,b; 2001]; and Total Quality Management (TQM)—captured here through the Shewhart-Deming Plan-Do-Check-Act cycle [PDCA: Deming 1986, Senge 1997] and the Malcolm Baldrige National Quality Award [Baldrige: MBNQ Improvement Act of 1987, Public Law 100-107; National Institute of Standards 2003]. Leveraging key principles of the Planning, Programming and Budgeting System [PPBS: Carlson 1969, Davis 2000, Fisher 1965, Schick 1966], an integrated public management model emerges that bridges the gap between business and government. This new management model for government offers a valuable conceptual framework and mechanism to measure and improve public services.

The next Section offers a brief background and introduction of the model. Sections 3, 4, and 5 review the key pillars of SUCCESS. In the course of introducing the model fresh insights are generated into a major piece of legislation that underpins most contemporary federal management reforms—the Government Performance and Results Act[3] (GPRA: Public Law 103-62). The final section employs the SUCCESS model to reveal key linkages between the five major government-wide initiatives that define the President's Management Agenda. [Bush 2002]

A NEW PUBLIC MANAGEMENT FRAMEWORK: THE SUCCESS MODEL

Based on the pioneering work of Osborne and Gaebler [1992], the aim of many contemporary U.S. federal, state and local reforms is to reinvent government through the application of private sector strategies and techniques. [Kearney, Feldman, and Scavo 2000] As first articulated in the National Performance Review (NPR), the fundamental objective of reinvention is to strive for a government that "works better, and costs less." [NPR, 1993][4] Contemporary reinvention at the federal level was set in motion with the adoption of total quality management (TQM) programs in the late 1980s and early 1990s. Today these management initiatives underpin most contemporary reinvention efforts. [Kearney, Feldman & Scavo 2000, 536]

The latest global round of reinvention—called "performance-based budgeting"—consists of a broad set of initiatives to measure the cost and performance of government activities, and to tie budgets to performance. [Halachmi & Bouckaert 1996, Premchand 1999] The Congressionally-mandated Government Performance and Results Act (GPRA) is the driving force behind these efforts in the United States. [Jones & McCafferey 1997, McNab & Melese 2003, OMB 1998, Walker 2000] A key challenge that faces federal agencies as they struggle to satisfy GPRA mandates—on the road to performance-based budgeting—is to develop a management and measurement framework based on the best the private and public sector have to offer. According to a noted authority, "political economy provides no agreed framework for how performance measurement should be carried out." [Boivard 1996 p.145] The SUCCESS model contributes by bridging the gap between business and government.

Substantial payoffs from integrating management initiatives have inspired companies (and increasingly governments) to turn to a variety of performance management and measurement frameworks for guidance. Notable among these are the Shewhart-Deming PDCA cycle, Kaplan and Norton's innovative "Balanced Scorecard," and the Malcolm Baldrige National Quality Award criteria.

Each framework has spawned its own distinct literature. The PDCA literature emphasizes continuous improvement and learning. BSC offers a valuable measurement system embedded in most ERP applications. The Baldrige Award introduces a comprehensive set of criteria (closely related to the International Standards Organization's ISO9000: 2000 "quality management principles") used to grant the nation's top prize for quality. Integrating these three popular performance measurement frameworks with fundamental

economic and accounting principles and the spirit of PPBS, a new public management model emerges called SUCCESS.

SUCCESS emphasizes the dual focus of reinvention: for a government to "work better"—shifting attention from inputs to outputs and the performance or effectiveness of those outputs ("outcomes" in GPRA), and to "cost less"—minimizing costs/budgets thereby releasing funds for other critical activities (e.g. fighting terrorism). Government executives are encouraged to preserve this dual focus in reviewing public investments in human capital, physical capital, new technology, rules and regulations, and the scale and scope of government operations.

THE FIRST PILLAR OF SUCCESS: THE SHEWHART-DEMING PDCA CYCLE

The first pillar and foundation of SUCCESS is the PDCA [Plan-Do-Check-Act] cycle of continuous improvement and learning. The Shewhart-Deming PDCA cycle—a cornerstone of TQM—emphasizes the role of constant learning, and continuous improvement, innovation and investment. (Deming 1986; Senge 1997) This involves four fundamental questions: What to do? How to do it? How well did we do? and What should we do next? The key components of the PDCA cycle in SUCCESS are:

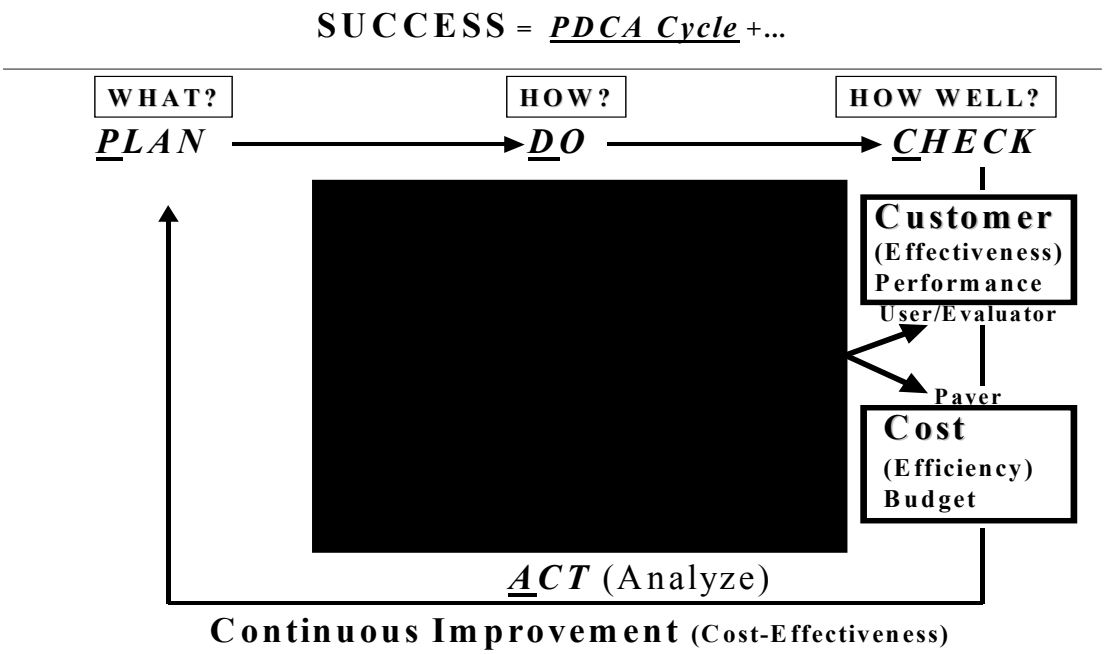
- ***PLAN*: What** to do?
    - Identify an organization's "customers"[5] and assess their expectations and demand for products and services. Search for ways to achieve "goal congruence" among customers with competing interests, and coordinate related programs. Align incentives so that customers' preferences are reflected in the organization's goals, and set corporate objectives to maximize the value to customers from the organization's products and services. Solicit, encourage and evaluate customer- and employee-driven product innovations that increase "effectiveness."
- ***DO*: How** to do it?
    - Identify alternative methods, techniques and incentive structures that lead public employees and government contractors to convert inputs into activities and outputs that satisfy customer demands. Search for the most economic and efficient solutions. Solicit, encourage and evaluate customer- employee- and contractor-driven process innovations that increase "efficiency" and achieve cost savings.
- ***CHECK*: How well** did we do?
    - Measure costs and benefits and tie budgets to performance. How much does it cost to generate the organization's products and

services? How much value or "effectiveness" is generated for the organization's customers?

- ***ACT*:** What should we do next?
    - Analyze, learn, and apply. Leverage benefit-cost information to increase accountability, to improve products and processes, and to guide future investments across activities and organizations.

PDCA provides a simple, yet powerful vehicle within which to investigate customer- and cost-focused production and investment decisions. The first pillar and foundation of SUCCESS is the Shewhart-Deming PDCA cycle illustrated in Figure 1.

FIGURE 1



The "double-loop" interpretation of the PDCA cycle incorporated in SUCCESS captures key elements of the Planning, Programming and Budgeting System (PPBS).[6] The first loop through PDCA emphasizes estimation (planning the demand for public goods and services and evaluating different ways of satisfying that demand), and budgeting (assessing the likely cost implications). The second loop emphasizes execution (operations and investments guided by first loop decision-making), and learning.

First installed in the Pentagon in 1961 as a decision-making framework to support the President's budget formulation process, PPBS has helped shape U.S. national security for over forty years. "The ultimate objective of PPBS is to provide operational commanders the best mix of forces, equipment, and support attainable within fiscal constraints." [DoD

Directive 7045.14, 1984] In an ongoing attempt to tie budgets to performance, PPBS continues to provide the structure and process under which U.S. military strategy is translated into an annual defense budget, that today accounts for nearly four percent of the U.S. Gross Domestic Product. [Rumsfeld 2002]

First Loop (planned performance and budgets): In the spirit of PPBS, the first loop through the PDCA cycle emphasizes: Planning (*PLAN*—estimate the derived demand for the organization's products), Programming (*DO*—estimate the production function i.e. identify technically efficient choices and investments to produce and deliver those products)[7], and Budgeting (*CHECK*—estimate expected budget or cost implications to payers, and the planned performance or effectiveness of products to users and evaluators). (See Figure 1) A key attribute of PPBS is that, while respecting fiscal constraints, it encourages senior management and elected officials to focus on output-oriented programs—e.g. defending the nation against existing and emerging threats.[8]

The SUCCESS framework emphasizes the role of "ACT" (learn and apply, or analyze) in linking benefit (performance) measures with cost (budget) estimates to improve public decision-making. Whereas in business these joint concerns are typically captured in discounted net present value profit calculations (revenue-cost analyses), in the public sector they take the shape of benefit-cost analyses. [Fisher 1965]

As originally conceived, PPBS was meant to leverage benefit-cost analyses to assist senior defense officials to establish priorities within the budget, and to shift resources among defense programs—and across the military services—from less to more productive uses, in response to changes in the national security environment. [Schick 1966] The ability to link performance and cost data to improve public sector decision-making is a key component of the President's Management Agenda, and the ultimate stated goal of the GPRA.[9]

PDCA offers a closed loop, customer- and cost-focused cycle of continuous improvement, innovation and investment. This dual focus offers public officials an opportunity to distinguish between two key categories of public investments: 1) "effectiveness" investments—*customer-focused* efforts to improve product performance, and 2) "efficiency" investments—*cost-focused* efforts to minimize production and transaction costs.

Second Loop (actual budget and performance): The second loop through PDCA emphasizes execution and learning.[10] It combines first-loop benefit-cost calculations with other relevant concerns to decide "what to do" and "how to do it." Benefit-cost information collected in the first loop supports management in updating the PLAN—determining which course(s) of action to adopt and which (if any) investments to pursue. The ensuing DO phase executes the plan—performing chosen course(s) of action. Observed outcomes, and realized costs (budgets) associated with those outcomes, are revealed in the subsequent *CHECK* phase.

The second-loop *ACT* (or "Analyze") phase offers a chance to learn—to record and evaluate any systematic variances between actual and planned performance, and between

actual and planned budgets. Comparing planned and actual results is a key requirement of GPRA. [OMB 1998] Beginning with the 2003 federal budget, federal agencies now submit annual performance reports to the Congress that measure their realized performance (or "outcomes") relative to plans, together with their budget requests for each program. This important first step towards performance-based budgeting serves to increase transparency and accountability, and offers a valuable opportunity for public officials to learn from their decisions. The double-loop PDCA cycle—the first pillar of SUCCESS—is designed to improve public decision-making by encouraging continuous monitoring and evaluation of performance, budgets, and returns on investments.[11]

THE SECOND PILLAR OF SUCCESS: THE BALANCED SCORECARD

The second pillar of SUCCESS is the innovative Balanced Scorecard (BSC) developed by Kaplan and Norton [1992; 1996a,b, 2001]. Variations of BSC are embedded in virtually every modern Enterprise Resource Planning (ERP) application (cf. 1), and are increasingly being adapted to government activities (see Green, et. al. 2003, or the U.S. military's new "Risk Management Framework"—Rumsfeld 2002). Recognizing the limitations of strictly financial measures of performance, BSC translates an organization's goals into objectives and measures organized into four balanced perspectives: Customer, Financial, Internal Business Process, and Learning & Growth.

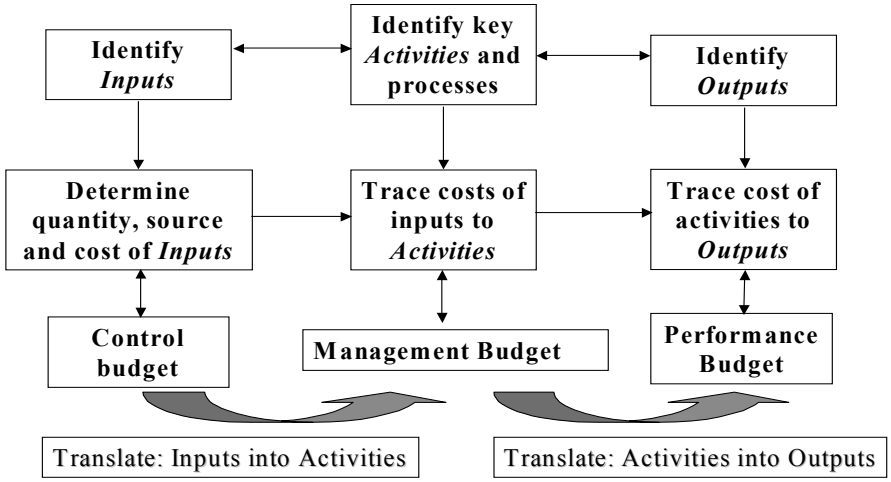
In SUCCESS, the "Customer" (performance or effectiveness) perspective and "Financial" (budget or cost) perspective offer a ***CHECK*** on past efforts. These two perspectives reveal benefit and cost information that assist public officials in planning future budgets and performance. Meanwhile, the BSC's "Internal Business Process" perspective highlights the organization's production function. These are the internal activities an organization must ***DO*** to convert inputs into outputs to satisfy its customers (users and evaluators).

In SUCCESS, the cost implications of an organization's internal business processes (inputs, activities, outputs, etc.) are revealed through Activity-Based-Costing (ABC). Embedded in most ERP applications, ABC initiatives help companies to understand the benefits (i.e. revenues) and costs of individual products and customers, to manage those costs, and to evaluate new investments. (See Johnson & Kaplan 1987, Brimson & Berliner 1988, Player & Cobble 1999)

An added bonus for government officials is that ABC offers a valuable set of integrated public budgeting perspectives: a) a control or appropriation budget for inputs (with its focus on accountability), b) a management budget for activities (with its focus on efficiency), and c) a performance budget for outputs (with its focus on effectiveness). Figure 2 couples ABC with these three vital stages of public budgeting.[12] [Schick 1966]

FIGURE 2

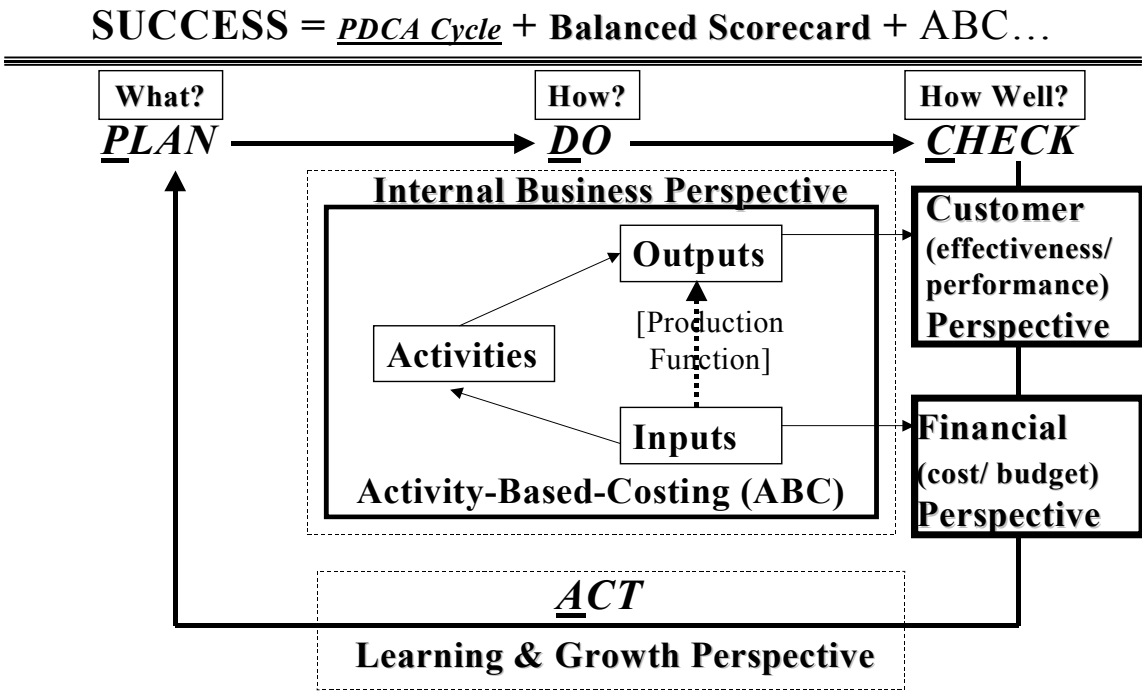
Activity-Based-Costing/Budgeting



Incorporating ABC into SUCCESS unlocks the black box that is BSC's "Internal Business Processes perspective." ABC reveals an organization's internal activities and uncovers the true economic costs of its outputs.[13] Once links between inputs, activities and outputs are clearly established, the focus can then turn to improving efficiency (or managing costs). In stripping away the black box of an organization's internal business activities, ABC promotes increased transparency and efficiency in the conduct of government activities. (See Figure 3)

The fourth major component of BSC is the familiar "Learning & Growth" perspective. Analogous to "continuous improvement" in PDCA, "Learning" in SUCCESS involves integrating Customer (benefit) and Financial (cost) perspectives to assist public officials in choosing "effective" customer-focused product investments, and "efficient" cost-focused process investments, that ***ACT*** upon the future "Growth" and performance of the organization. Figure 3 couples the four BSC perspectives with the PDCA cycle to complete the first two pillars of SUCCESS.

FIGURE 3



PDCA & BSC are the backbone of SUCCESS. But to bring the model to life requires the third and final pillar—drawn from TQM—the Baldrige Award criteria.

THE THIRD PILLAR OF SUCCESS: THE MALCOLM BALDRIGE NATIONAL QUALITY AWARD

Completing the SUCCESS framework is the Malcolm Baldrige National Quality Award. [MBNQ Improvement Act of 1987: Public Law 100-107] Any award implies an underlying framework against which performance is assessed. Closely related to the International Standards Organization's ISO 9000: 2000 "quality management principles," the Baldrige framework consists of seven major criteria used to grant the nation's top prize for quality. [National Institute of Standards 2003] These seven criteria make up the third and final pillar of SUCCESS.

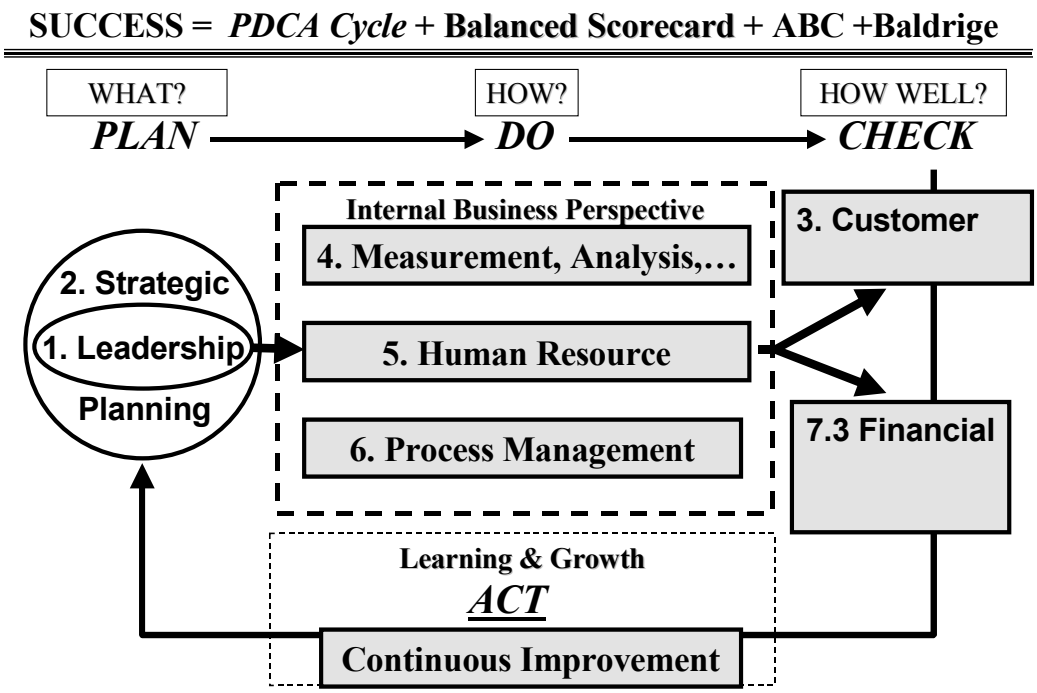
The Baldrige framework is built upon the core concept of "Continuous Improvement and Learning." (Garvin, 1991) This reflects both the ***ACT*** phase of the PDCA cycle and BSC's "Learning & Growth" perspective. A common thread is to encourage continuous product (effectiveness) and process (efficiency) improvements through innovation and investments. Table 1 maps the seven Baldrige criteria into the PDCA cycle and the Balanced Scorecard (BSC). [14]

Table 1: Performance Management & Measurement

BALDRIGE	PDCA	BSC	
1. Leadership	*PLAN*	Strategy	
2. Strategic Planning	*PLAN*	Strategy	
3. Customer & Market Focus	*CHECK*	Customer Perspective	
4. Measurement, Analysis,…	*DO*	Internal Business	
5. Human Resource Focus	*DO*	Internal Business	
6. Process Management	*DO*	Internal Business	
7.3 Financial & Market Results	*CHECK*	Financial Perspective	

The first two criteria, Leadership and Strategic Planning, map directly into the PLAN phase of SUCCESS and correspond to the latest addition to BSC—"Strategy." [Kaplan & Norton 2001] "**Leadership"** roles include: ensuring goal congruence (identifying and aligning preferences of users, payers, and evaluators), communicating missions, goals and objectives; allocating budgets; coordinating investments; contributing to the development of organizational procedures and routines; aligning incentives; rewarding innovation; and reviewing organizational performance.[15] SUCCESS offers leadership a framework that encourages managers to ***PLAN*** to boost customer-driven performance (effectiveness), and cut costs (efficiency). (See Table 1 & Figure 4)

FIGURE 4: SUCCESS = ABC + BSC + TQM



In setting direction, assessing threats, and seeking future opportunities, Leadership is at the center of "Strategic Planning"—the second Baldrige criterion. This criterion emphasizes communicating, deploying, and reviewing customer-focused goals and objectives, and identifying the activities and resource allocation decisions—marginal trade-offs, schedules, processes, and incentives—necessary to accomplish those objectives (constrained by budgets, laws, rules and regulations). Together, Leadership and Strategic Planning constitute the core sub-components of the PLAN phase of SUCCESS. (See Figure 4)

In SUCCESS, Leadership and Strategic Planning are squarely aimed at the third Baldrige criterion, "**Customer Focus**." This corresponds to BSC's Customer perspective and is mapped into the Customer (performance or effectiveness) component of the ***CHECK*** phase of SUCCESS. Recording the cost implications of an organization's productive activities is the other component of the ***CHECK*** phase. In Baldrige, this corresponds to the Financial results (or budget) sub-component of "**Business Results"**—analogous to BSC's Financial perspective.[16] (See Table 1 and Figure 4)

The remaining three Baldrige criteria -- "**Measurement, Analysis & Knowledge Management**," "**Human Resource Focus**," and "**Process Management"—**roughly correspond to information, labor, and capital inputs in a standard economic production function. The SUCCESS model offers a valuable conceptual guide to help steer the development of **Measurement, Analysis & Knowledge Management** systems.[17] The

Human Resources component involves recruiting, hiring, training, retaining, and motivating people.[18] The challenge of **Process Management** is to manage supply chains. This includes purchasing, operating, maintaining, and organizing infrastructure, materials and equipment that—combined with **Human Resources,** and **Measurement, Analysis & Knowledge Management—**generates cost-effective public products and services.[19]

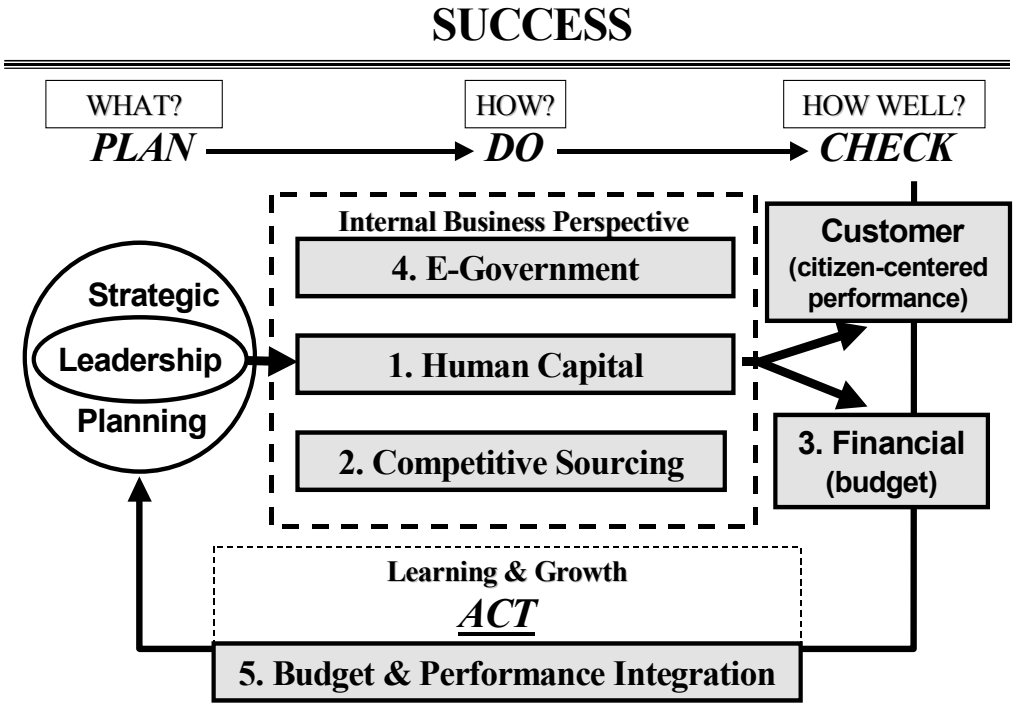
Together these three Baldrige criteria fall under the Balanced Scorecard's Internal Business Perspective—mapped into the ***DO*** phase of SUCCESS.[20] (Table 1) Mapping the seven Baldrige criteria onto the first two pillars of SUCCESS—PDCA and BSC—completes the basic framework.[21] (Figure 3 & 4) The next section applies the model to reveal key linkages that connect the five major initiatives that define the President's Management Agenda. [Bush 2002]

LEVERAGING SUCCESS: THE PRESIDENT'S MANAGEMENT AGENDA

The President's Management Agenda focuses on five interrelated initiatives intended to transform the basic operations of federal agencies. [Bush 2002 and President's Quality Award criteria 2003][22] Overseeing the process are the federal government's chief operating officers—the deputy secretaries of each federal agency—together with the Office of Management and Budget (OMB). The President's Management Agenda is based upon several core principles including a "citizen-centered" and "results-oriented" government "dedicated to ensuring that resources entrusted to the federal government are well managed and wisely used." [Bush 2002 p.1] The clear message for federal activities at every level is to keep in mind their ultimate customers (users, payers and evaluators) are citizens and taxpayers. The Agenda's five government-wide initiatives include: Human Capital, Competitive Sourcing, Financial Performance, E-government, and Budget & Performance Integration.

The first major government-wide initiative is the "**Strategic Management of Human Capital**." Analogous to the Human Resource criterion in Baldrige, in SUCCESS this first initiative falls under BSC's Internal Business Perspective in the DO phase of PDCA.[23] (See Figure 5) According to the President's Management Agenda, federal agencies are expected to link their human capital (investment) strategies to organizational goals and objectives, and to determine their core competencies—deciding what to do themselves, and what services to contract from the private sector. This contracting decision involves the second major initiative in the President's Management Agenda, "**Competitive Sourcing**." In SUCCESS this initiative falls under BSC's Internal Business Perspective. (See Figure 5)

FIGURE 5: President's Management Agenda



Based on evidence that "increased competition consistently generates significant savings and noticeable performance improvements" [p.18], the Competitive Sourcing initiative aims "to achieve "efficient and effective competition between public and private sources." [p.17] By subjecting commercial activities performed by the government to competition, the aim is to pressure those activities "to produce quality services at a reasonable cost." [p.17]

To obtain the necessary data to conduct competitions between public activities and the private sector requires the next government-wide initiative -- "**Improved Financial Performance**." Although mostly focused on Financial Results, this initiative is also closely related to the Baldrige criterion—Measurement, Analysis & Knowledge Management. The aim of this initiative is to "ensure [through financial audits] that federal financial [cost] systems produce accurate and timely information to support operating budget, and policy decisions." [p. 20] This requires new investments in information technology, ERP and communication systems to generate and share data "more quickly and conveniently," that can also be leveraged to make transactions "easier, cheaper, [and] quicker." [p.21]

Identifying **Electronic-government** investments that can deliver significant productivity (cost) and performance (effectiveness) gains across government is the fourth major

initiative in the President's Management Agenda. [p.24] E-government is a valuable tool and input in the production of public goods and services. (See Figure 5)

The final government-wide initiative, **Budget & Performance Integration**, emphasizes the dual focus of the President's Management Agenda—assessing the costs and benefits of government activities. The integration of budget and performance information supports Learning & Growth (BSC) in the SUCCESS model, and appears in the ACT phase of PDCA. In SUCCESS the "ACT" (learn and apply, or analyze) phase emphasizes linking benefit (performance) measures with cost (budget) estimates to improve public decision-making. Combining budget and performance information offers elected and appointed officials the opportunity to leverage cost-benefit analysis to guide public investments and continuously improve government services. (See Figure 5)

The President's Management Agenda concludes "the American people should be able to see how government programs are performing and compare performance and cost across programs." (See Appendix 1) However, it bemoans the fact that "the lack of a consistent *information and reporting framework* for performance, budgeting, and accounting obscures…necessary transparency." [p.28]

This paper demonstrates how integrating key principles of Activity Based Costing (ABC), the Balanced Scorecard (BSC), Total Quality Management (TQM), and the Planning, Programming and Budgeting System (PPBS) can generate such a framework. The model that emerges reveals a unified logic and key linkages to assist government executives to connect the five major initiatives that define the President's Management Agenda. Widespread adoption of the SUCCESS model would facilitate efforts to satisfy the GPRA's ambitious agenda: 1) To "improve congressional decision-making by providing…information on…the relative effectiveness and efficiency of…program spending," 2) To "improve [the] internal management of the Federal Government," and 3) To "improve…service quality, and customer satisfaction" and "the confidence of the American people…by holding agencies accountable for …results." (1993 GPRA, Public Law 103-62)

CONCLUSION

In recent testimony to the Congress, the U.S. Comptroller General stated "whatever role the American people choose for the federal government, its activities should be conducted in the most effective [and efficient] manner possible." This requires a "fundamental reexamination of government missions, functions, and activities [to] improve government effectiveness and efficiency and enhance accountability." [Walker 2003 p.1] Modern governments throughout the world face the same basic set of management challenges: a) to improve effectiveness—emphasizing outputs over inputs; b) to improve efficiency—managing costs; and c) to improve accountability—tying budgets to performance. This increased emphasis on measurement has government executives struggling to adapt business management frameworks to the public sector. The objective of this paper was to propose an economic benefit-cost approach to help bridge the gap between business and government.

Resting on fundamental economic and accounting principles, the **S**uper-**U**nified **C**ustomer and **C**ost **E**valuation **S**trategic **S**ystem (SUCCESS) model[24] integrates three popular business management frameworks that underpin many commercial ERP[25] applications: Activity-Based Costing (ABC), the Balanced Scorecard (BSC), and Total Quality Management (TQM)—captured here through the Shewhart-Deming Plan-Do-Check-Act cycle (PDCA) and the Malcolm Baldrige National Quality Award. Leveraging key principles of the Planning, Programming and Budgeting System (PPBS), the new public management model that emerges offers a strategic blueprint for public officials to measure and improve government services. [26]

We conclude with a note of caution. As a distinguished pioneer in government cost analysis rightly emphasizes, "in reality, most major…decision problems must ultimately be resolved primarily on the basis of intuition, [politics], and judgment." [Fisher 1965 p.186] Ideally, while the SUCCESS model would serve to sharpen this intuition and judgment, we must also recognize incentive problems that face government officials at every level. [See McNab & Melese 2003] This concern is succinctly expressed in the President's Management Agenda. Today, there is "little reward, in budgets or in compensation, for running programs efficiently." [Bush 2002 p.27] Moreover "performance measures are insufficiently used to monitor and reward staff, or to hold program managers accountable."[27] [Bush 2002 p.27]

Many of the contemporary challenges faced by the world's governments in their struggle to measure and improve performance can be blamed on traditional "control" (or input) budgets. Recognizing these limitations, performance-based budgeting initiatives like the GPRA shift the emphasis of budgeting and accounting systems from principally a control function, to more of a management function, or from tracking inputs to generating outputs and outcomes. But substituting performance-based budgets for control budgets involves a major challenge—measuring performance.

This paper demonstrates how several popular business management frameworks can be integrated with a prominent public budgeting framework to help support this effort. Combined with the appropriate incentives, the SUCCESS model is designed to assist public officials to realize the three chief goals of GPRA [Public Law 103-62]: to improve executive and congressional decision-making, to promote better internal management of government programs, and to increase accountability to taxpayers.

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APPENDIX I

GPRA legislation requires federal agencies to submit annual performance reports to Congress that detail realized performance (or "outcome") measures and the associated expenses (or budget) for each program. [OMB 1998] The goal is for OMB to use this information to allocate budgets across programs. The balanced scorecard (BSC), Baldrige, and ERP applications offer software that enable organizations to measure performance. This is typically done by an outside auditor (or consultant) who evaluates the organization based on a balanced assessment of a list of each component of the framework (e.g. Customer, Financial, Internal Business, and Learning & Growth). Usually a weighted score is assigned to each component. Summing the scores yields an overall measure of performance. This is a cardinal utility measure generated under the implicit assumption of an additive, linear separable utility function.

The latest example of this is the "Program Assessment Rating Tool" (PART), still under development by the Office of Management and Budget (OMB). Designed specifically to measure the performance of federal programs for GPRA, PART consists of a set of questions used to evaluate DoD and other federal activities across four broad areas: "program relevance," "strategic planning," "program management" and "program results." The answers given are then evaluated and scored by OMB. Adding up the weighted scores yields a cardinal utility value—an overall performance measure—for each program. The dual goal expressed by OMB is to use these performance measures for cross-program comparisons (analogous to inter-personal utility comparisons), and to weave this performance data into the President's budget. [OMB: http://oamweb.osec.doc.gov/bsc/guide.htm 6/20/02]

Leaving aside the enormous challenge of cross-program comparisons, our view is that any performance measures derived by summing weighted scores using components of BSC, Baldrige, PART or any other management framework are at best difficult to interpret, and at worst, misleading. Since these performance measures implicitly assume a linear separable utility function, they are based on two key assumptions. First, that the model components are mutually exclusive, which generally does not hold—in which case there is double counting. Second, that the components are independent, which generally does not hold—in which case an additive, linear separable aggregation ignores (conceals) important (causal) relationships (or cross linkages) between the different components of the framework. For example, in the case of PART, this simple aggregation approach camoflages explicit relationships between input-oriented components of the model (say "program management") and output-oriented components (say "program results").

Economics offers a significantly different view. That view is reflected in the production function approach that underlies the SUCCESS model. In SUCCESS, "performance" is measured as the utility derived by "customers" consuming and/or evaluating an organization's output(s). (See Fisher 1965) For DoD this could involve a variety of measures including surveys of (internal) customer satisfaction, willingness to pay, votes, readiness, deterrence, and other output-oriented measures. Moreover, SUCCESS guides public organizations to apply ABC to capture production and transaction costs of outputs that generate that performance, to establish the cost implications of achieving different levels of performance.

ENDNOTES

* An early draft of this paper was presented at the RAND sessions of the Western Economic Association Meetings in San Francisco, CA., 7/6/01. Subsequent versions have benefited from valuable conversations with NATO and U.S. Department of Defense officials, faculty members at the Naval Postgraduate School and Syracuse University, and researchers at the RAND Corporation. We are also grateful for valuable comments from two anonymous referees. The usual disclaimers apply.

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[1] Not all governments are alike in the challenges they face. To newly emerging democracies struggling to introduce planning and budgeting systems, and where institutions are still relatively weak and corruption commonplace, the model in this paper might represent a "best case" or "end state" of development that offers and encourages transparency and accountability in government operations.

[2] A descendent of the management information systems (MIS) and Material Resource Planning (MRP) movements, Enterprise Resource Planning (ERP) was initially led by SAP, a German software company. Today, multiple suppliers including IBM, Microsoft, PeopleSoft, Baan, Seibel, and others offer ERP applications designed to streamline and integrate operation processes and information flows in a company to increase productivity and cut costs. These customized software solutions apply the latest data base, reporting and analysis tools in an attempt to measure, monitor and integrate various functional areas like: manufacturing, sales and marketing, distribution, customer service, accounts payable/receivable, purchasing, inventory and material planning, human resources, financial accounting, asset management, project scheduling, etc.

[3] The lead agent responsible for implementing the GPRA is the Office of Management and Budget (OMB). OMB requires yearly performance reports from all federal agencies together with their budget submissions. [OMB Circular A-11, 1998]

[4] A working assumption is that voters/taxpayers answer the strategic question of *WHAT* they want the government to do through their representatives, for example with legislation or a constitutional provision to provide national security. This still begs the question of *HOW* to do it? Steering clear of disputes over the role of government in society, this paper instead focuses on developing a model and mechanism to assist government officials to minimize the (production + transaction) costs of providing public goods & services ("*operational* efficiency"), to select the most effective programs among competing programs ("*allocative* efficiency"), and to evaluate investments to improve the value ("efficiency" and "effectiveness") of public goods and services over time.

[5] Using the term "customers" in the context of government-generated goods and services is a contentious issue. While private companies typically plan "what to do?" in anticipation of and in response to customer demand, most public organizations face the delicate task of "goal congruence"—or of soliciting and balancing the often conflicting tastes and preferences of multiple "customers." Unlike the private sector where a customer typically combines the roles of user, payer and evaluator, in government these tasks are often separate and distinct. For instance, consider the simple case of a repair action on the engine of an attack aircraft. The pilot is the ultimate "user," the maintenance activity (or Wing) the "payer," while third parties (auditors/inspectors) might evaluate the quality of the repair. SUCCESS reserves the term "customer" exclusively for *users* and *evaluators*. Users and evaluators in government can take different forms including: military operators, other support activities, public servants, defense contractors, elected and appointed officials (congress), citizens (voters, taxpayers), unions, the media, and lobbyists. An underlying assumption of SUCCESS is that users and evaluators care more about "effectiveness," and payers more about "efficiency." Accordingly, a major tenet of SUCCESS is to encourage and reward continuous customer-focused improvements in public products and services (effectiveness), and cost-focused improvements in internal business processes (efficiency).

[6] Federal agencies like DoD typically have procedures in place to accomplish three objectives: 1) forecast the (derived) demand for their services (say based on threats to national security), 2) identify the most promising activities and investments to meet that demand, and 3) prepare budgets for review by elected officials. [Business Executives for National Security (BENS) 2000] These three objectives correspond to the three phases of PPBS (Planning—What to do? Programming—How to do it?, and Budgeting—What will it cost?). PPBS offers a valuable mechanism for top-level decision-makers to make budget allocation decisions—to seek "allocative efficiency"—and to translate high-level program outputs into input appropriations—to achieve fiscal accountability. [Enthoven & Smith, 1971]

[7] A key attribute of PPBS is that it encourages defense officials to think in terms of programs (collections of activities or outputs) instead of line-item expenditures (inputs). In evaluating programs that compete for scarce budgetary resources, the PPBS process generates expected costs (and to a lesser extent benefits), and forecasts of the future costs and consequences of current decisions. The "Programming" phase of PPBS encourages an analytical, multiyear approach to investments based on cost-benefit analysis and a "systems" view. The multiyear aspect of PPBS focuses on calculating discounted life-cycle costs of investments, and on inter-temporal trade-offs between current and future

readiness. The "systems" approach emphasizes a complete assessment of alternative investments, including any necessary complementary investments and the likely impact of any negative or positive externalities. The "Future Year Defense Plan" (FYDP) is the information and accounting tool that supports this effort.

[8] The SUCCESS model augments the high-level management information system that is PPBS by offering a guide for lower-level activities to achieve "operational efficiency." The first-loop *PLAN* phase of SUCCESS is launched when the Defense Planning Guidance (DPG) trickles down to lower-level organizations, prompting a review of missions, goals and objectives in light of that planning and fiscal guidance. The subsequent *DO* phase in SUCCESS corresponds to the Programming phase in PPBS. Ideally, in this phase the Services review their existing activities, and identify incremental adjustments (input substitution, outsourcing opportunities, etc.), or new product investments (to increase effectiveness) and process investments (to increase efficiency), that respond to PPBS guidance. This is referred to as the Program Objectives Memorandum or POM process. The *CHECK* phase in this first loop requires activities to develop budget estimates based on POM decisions taken by the Secretary. These are included in the budget estimate submissions (BES) of the services and agencies and ultimately find their way into budget estimates included in the President's defense budget submission to Congress. (DoD Instruction 7045.7, 1984)

[9]The fifth and final government-wide initiative in the President's Management Agenda is "Budget and Performance Integration." (Bush 2002) The GPRA's ambitious agenda includes three principle objectives: 1) To "improve congressional decision-making by providing…information on…the relative effectiveness and efficiency of…program spending," 2) To "improve [the] internal management of the Federal Government," and 3) To "improve…service quality, and customer satisfaction" and "the confidence of the American people…by holding agencies accountable for achieveing…results." (1993 GPRA, Public Law 103-62)

[10]The second phase of PDCA in SUCCESS loosely corresponds to the newly adopted "Execution" phase in DoD's Planning, Programming, Budgeting and Execution (PPB*E*) System. What is strikingly revealed by SUCCESS, but still largely missing in the contemporary application of PPBE, is the value of the second ("execution and learning") loop launched after Congress passes the defense budget. "Systematic programmatic feedback from program and budget execution to subsequent planning and programming cycles was not originally built into the PPS concept." [The Joint DoD/GAO Working Group on PPBS, GAO/OACG-84-5, Sept. 1983, p. 17] The second loop of SUCCESS emphasizes execution of the budget approved by Congress, and more importantly for performance budgeting, emphasizes evaluation of the realized cost and performance of programs to guide future planning. The value of this feedback loop is reflected in the

recommendation to use historical Future Year Defense Plan (FYDP) data to learn from the past and to uncover any systematic forecasting errors. DoD can use FYDP data retrospectively to evaluate organizations and activities by comparing patterns of predicted costs and performance (first loop budgeting—estimation) to the pattern of actual costs and performance (second loop management—execution and learning). This suggests a shift from PPBE to PPBE-Squared: Planning, Programming, Budgeting, Execution & Evaluation. Continuously monitoring variances between predicted and actual costs (and performance) not only satisfies the spirit of GPRA, but also reveals the returns on public investments. This has the potential to increase transparency and accountability, resulting in more realistic estimates generated by the PPBS process. Improving defense decision models will enhance our ability to shape and adapt DoD to the changing threat environment.

[11] In DoD's Planning, Programming, Budgeting and Execution (PPBES) system post-audit mechanisms could be designed to review and evaluate past choices, and to generate a portfolio of experience—augmenting a data base like the Future Year Defense Plan (FYDP)—to improve future decisions. The late economist Bryan Jack (tragically killed in the terrorist attacks of 9/11/01) was instrumental in the contemporary development of the FYDP. He recognized the cumulative experience collected in the FYDP offers an opportunity to use past experience as a guide to improve future decisions. He also recognized the key challenge of performance-based budgeting—collecting output-oriented data that accurately reflects performance or "effectiveness." (Jack 1997). Applying the first pillar of the SUCCESS framework (PDCA) would suggest using FYDP data retrospectively to learn from the past, and to reveal any systematic cost estimating/forecasting errors that might indicate systematic biases in estimating the future consequences of current decisions. For instance, if an analyst's income and promotion opportunities are based on his/her success in introducing new programs and not killing old ones, then optimistic cost estimates/forecasts would tend to be reported. This systematic underestimate of the true (O&S) costs of new programs would eventually be reflected in budget shortfalls for the actual operation and maintenance of new systems. The accountability built into the double-loop PDCA cycle in SUCCESS is designed to reveal such biases to allow policy makers to anticipate problems and make any necessary adjustments.

[12] The GPRA represents a significant shift in emphasis of federal budgeting and accounting systems from principally a control function, to more of a management function, or from tracking inputs to generating outputs. [GAO 1997] Augmenting a control budget's capacity to measure and track inputs, performance budgeting initiatives like the GPRA attempt to focus officials on "activities" (intermediate products and processes), "outputs," and "outcomes"—the utility or effectiveness derived by other agencies or taxpayers. The ultimate goal of the GPRA is to move from "control budget

contracts" to "performance budget contracts"—or to relate data on program performance (outputs and outcomes) to appropriation account structures (inputs), to form the basis for improved budget and resource allocation decisions. [GPRA, 1993]

[13] Admittedly ABC is particularly challenging for government operations, and is often aggravated by a mismatch between authority, responsibility and account structures. However, starting at the federal level, the President's 2004 budget emphasizes "[b]reaking down the 'stovepipes' that separate planning, budgeting, financial management, and evaluation…[and stresses that] budgets are more meaningful when they tell the cost of producing an output or achieving a performance goal." (Analytical Perspectives "Budget and Performance Integration" p. 7) In preparing its 2004 budget the Department of Justice's "planning, budget, and financial management teams at all departmental levels worked together. They identified major program activities…and requested budget authority to reflect the full cost of outputs produced by each [activity]." (p. 8) Moreover, "NASA recently modified its account and program activity structure to show the full cost of its programs." (p. 9) In preparing its 2004 budget "NASA…traced all of its costs to the program activities for which they are used, even allocating overhead. For each program activity, they…request[ed] budget authority for all associated costs." (p. 12) Another illustration of an ABC-type approach is the way DoD's Future Year Defense Plan (FYDP) translates or "crosswalks" major programs (activities and outputs) into congressional appropriation categories (inputs), over time. Applying ABC within the framework of SUCCESS in DoD and in other federal agencies could significantly improve available data and would make the FYDP a valuable source of information to learn from the past and improve future decisions. However, until all relevant costs connected to specific activities and outputs are captured through accrual accounting (including capital costs, retiree benefits, overhead allocation, etc.) measurements will neither be sensitive, reliable, nor valid.

[14] SUCCESS employs the four BSC perspectives and the seven Baldrige criteria as a management guide and model, not to generate a performance index score (or cardinal utility measure) to evaluate organizations (red, yellow, green) or to award a prize. Table 1 and Figure 4 represent an attempt to establish logical relationships among the Baldrige criteria based on fundamental economic and accounting (ABC) principles, and to connect them with the other two pillars of SUCCESS.

[15] Ongoing assessment of an organization's Strengths, Weaknesses, Opportunities, and Threats (SWOT) is another important role for leaders. Identifying "Strengths" and "Weaknesses" reveals an organization's competitive advantages. Responding to Opportunities and Threats involves reviewing products and organizational boundaries to maintain competitiveness and minimize production and transaction costs.

[16] In order to ensure consistency and avoid "double-counting," the Financial Results sub-component (7.3) of the Baldrige category Business Results is used in SUCCESS. All

other sub-components of Business Results (see www.quality.nist.gov) are returned to their respective categories.

[17] Information Technology (IT) is the glue that binds organizations. The challenge is to develop cost-effective IT architectures to ensure accountability, and encourage efficiency and effectiveness. This requires output measures and standardized multi-year performance budgeting systems to provide the timely, accurate budgeting and accounting data necessary to improve decision-making. The goal of SUCCESS is to guide the development of information systems in government organizations that provide reliable, consistent, and useful cost (budget) and output/outcome (performance) data to improve budgeting and management decisions.

[18] The organization's derived demand for labor is specifically addressed in the Human Resource Focus criteria. Operating in multiple labor markets, the challenge is to choose an optimal mix of labor that, combined with capital and other inputs, generates the output (or services) required at minimum cost. This requires choosing cost-minimizing mixes of skills and qualifications, and then recruiting, organizing, training, evaluating, and compensating labor (subject to constraints of personnel regulations) to resolve principal-agent problems and increase the productivity of the work force. The SUCCESS framework is designed to help identify the most economic and efficient combination of capabilities to perform value-added activities. One of the more useful results of embedding ABC in SUCCESS is that it can quickly reveal similar or duplicative capabilities and non value-added activities. The management implications include consolidation (assuming economies of scale) and/or re-allocation of capabilities.

[19] Helping answer the question "Who is going to do what?" the "Internal Business Process" component of the model requires defining the boundaries of activities and organizations. This includes decisions on the extent of coordination, cooperation, and division of labor within and among internal organizations. Process Management focuses on coordinating internal and external supply chain activities (including labor, capital and other assets) to generate desired outputs. This involves a combination of supply chain logistics and production function approaches, supported by multi-year linkages between operating and capital budgets, to capture the life-cycle costs of major assets including construction, procurement, maintenance, and labor requirements. For example, in DoD this would involve Logistics, Acquisition/Procurement and Installations operations, which is the responsibility of the Under Secretary of Defense Acquisition, Technology & Logistics. The Human Resource Management component is the responsibility of the Under Secretary of Defense for Personnel & Readiness.

[20] Consider an application of the SUCCESS framework to evaluate a prospective investment to improve employee training and satisfaction. In recent testimony to Congress, Dr. Mihm of the GAO emphasizes that: "[a]ttention to strategic human capital management is important because building agency employee's

skill, knowledge, and individual performance [is] a cornerstone of any serious effort to maximize the performance…of the federal government. GPRA, with its explicit focus on program results, can serve as a tool for examining the programmatic implications of an agency's strategic human capital management…" p.6 (Mihm 2001) The SUCCESS framework expects satisfied and well-trained employees to reward the organization with increased productivity that leads to improved performance in terms of increased customer satisfaction and/or cost savings. Consider the case of cost savings. In SUCCESS, measures of employee training and satisfaction are captured in *Human Resource Focus* (criteria #5), corresponding productivity gains in *Process Management* (criteria #6), and performance outcomes in terms of (net) cost savings in the "*Financial* (budget/cost or efficiency) *Focus*" (a modification of criteria #7). Supplementing these linkages with econometric relationships has the potential to generate powerful insights—for example, to forecast cost savings from alternative investments in human capital.

[21] SUCCESS can be used to generate a variety of practical management perspectives. Specific applications include: [To answer "For whom?"] 1) a "planning guide"—to build consensus over objectives and achieve goal congruence; [To answer "Why should they?] 2) a "team guide"—to help align incentives and foster collective responsibility; [To answer "Who is going to do what?"] 3) an "outsourcing guide"—to track transaction costs and define suitable boundaries of the organization; 4) a "quality guide"—to integrate concepts like: "empowerment," "hoshin planning," "flexible manufacturing," "kaizen costing," and "kanban" (cycle-time reduction, capacity management and just-in-time inventory); 5) a "tool guide"—to identify relevant analytical measurement (econometric and operations research) tools, techniques, and measures; or 6) an "investment guide"—to help uncover and evaluate opportunities to cut costs (efficiency) and improve performance (effectiveness). For instance, applying the SUCCESS model in DoD would require asking what decisions a Commander might need to take: 1. To request new funds/resources to increase readiness? (e.g. Where should we focus (make investments or concentrate resources) to increase readiness?), 2. To reallocate existing funds or resources to achieve savings (e.g. Where can we cut back (reallocate resources) with minimal impacts on readiness?), or 3. To understand tradeoffs between current and future readiness.

[22] Note that the 2003 President's Quality Award criteria used to evaluate federal government organizations for the annual "Presidential Award for Management Excellence" are the same as the government-wide initiatives that make up the President's Management Agenda. [www.opm.gov downloaded 8/15/03]

[23] Under this initiative DoD is working with Congress to get approval for a new personnel system for civilians that mirrors many of the innovations created for the new Department of Homeland Security. These include switching to a pay-banding system, implementing a separate pay structure for managers, modifying job classifications, changing hiring authorities, and using a pay-for-performance evaluation system. Meanwhile, the National

Aeronautics and Space Administration (NASA) is also seeking personnel flexibilities to allow the agency to pay bonuses for recruitment and relocation of employees and to permit exchanges of NASA personnel with private companies and other organizations.

[24] Here the term "model" is used in the broadest sense best described by a pioneer in cost analysis, Gene Fisher. [Fisher 1965] Fisher emphasizes the main purpose in designing a model is threefold. First, "to develop a meaningful set of relationships…[and identify] relevant alternatives [courses of action to achieve stated objectives]." Second, "to systematically examine alternative courses of action in terms of utility and cost, with a view to clarifying the relevant choices (and their implications)." And finally, "to facilitate the development of estimating relationships that will permit making estimates of benefits and costs of alternative future courses of action." [Fisher 1965 pp.181-2,9] The SUCCESS model is designed with these three elements in mind. It offers the possibility of structuring a "critical examination of alternatives [that]…involves…two main [considerations]…assessment of the cost…and the utility (benefits or gains) pertaining to each of the alternatives being compared to attain stipulated objectives." [Fisher 1965 p.185]

Whereas each individual framework (ABC, BSC, TQM, and PPBS) that make up the SUCCESS model could independently serve as a measurement and monitoring tool, as originally conceived these frameworks would struggle to qualify as models under Fisher's definition. In contrast, the SUCCESS model explicitly emphasizes relationships between inputs, activities, and outputs (the production function), in satisfying customers at the lowest possible cost, with an eye on future investments that would cut costs or improve public services.

[25] Enterprise resource planning (ERP) consists of a set of commercially available management tools employed by firms to achieve "operational efficiency." These customized software solutions apply modern data-base, logistics (transportation, inventory and network scheduling algorithms), operations research, market demand estimation, forecasting, simulation, and other advanced tools and techniques to measure, monitor and integrate business activities in an attempt to increase productivity, and minimize production and transaction costs. ERP applications sold by Baan, IBM, Microsoft, Oracle, PeopleSoft, SAP and others, are designed to leverage a company's "core competencies" (or comparative advantage), and streamline and integrate its production processes and information flows to boost profits.

[26]ABC accounting provides a methodology to measure the cost of government inputs, activities, and outputs. The BSC and Baldrige frameworks offer different perspectives

and criteria that focus on generating those outputs (converting inputs into outputs), and interpreting the outcomes (customer or performance and cost or budget consequences). Finally, coupling PDCA with the spirit of PPBS offers an analytical benefit-cost framework to guide future operational (e.g. competitive sourcing) and investment (e.g. E-government) decisions.

[27] Games people play and a way around them: Departments can withhold the information needed to make trade-offs; can enter into logrolling coalitions with other claimants to protect their respective budgets against cutbacks and reallocations; and can mobilize support among affected special interests and within the government. Politically savvy claimants can hide the full cost of policy initiatives, take programs off budget (e.g. black programs), and strategically underestimate (or overestimate) budgetary impacts. The President's FY 2004 budget attempts to address these issues and represents a first step towards performance-based budgeting at the federal level in the United States. As part of the budget process, the Office of Management and Budget (OMB) evaluated the results of 20 percent of all federal programs using their Program Assessment Rating Tool (PART). (See Appendix 1) For the 2005 budget, OMB will assess another 20 percent of the programs, and then "use those assessments to inform budgeting decisions, support management, identify program changes, and promote performance measurement and accountability." [Lawrence 2003 p.12] According to the President's 2004 Budget proposal submitted to Congress, although "the art of creating an integrated performance budget is not yet fully developed or uniformly applied...OMB has begun a multiyear effort systematically to collect and publish integrated budget and performance information. When the project is complete, information will be routinely available to Congress and the public on how much agencies are spending on outputs and other performance goals." ("Analytical Perspectives" p. 10-11) Previously, "Americans could not readily assess program results, and could not compare performance and costs across programs." (p. 3)

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